Remarks

The present Amendment is in response to the Official Action mailed on April 28, 2005. The Official Action rejected claims 1-6 under 35 U.S.C. § 112, second paragraph as assertedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Official Action rejected claims 1 and 3-6 under 35 U.S.C. § 102(b) as assertedly anticipated by Heller et al., U.S. Patent No. 5,929,208 (Heller). The Official Action rejected claims 1 and 2 under 35 U.S.C. § 102(b) as assertedly anticipated by Lopez et al., Published U.S. Patent Application No. 2002/0125192. Claims 1-6 have been amended to be more clear and distinct. Claims 7-17 have been cancelled without prejudice. New claims 18-31 have been added. Claims 1-6 and 18-31 are presently pending.

The Rejections Under 35 U.S.C. § 112

Claims 1-6 stand rejected under 35 U.S.C. § 112, second paragraph as assertedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "reagent pixel" is clearly defined in the context of claim 1 as amended, and in the specification, for example at page 13, line 25 – page 14, line 31 discussing Fig. 10. Area 1014 of surface 1002 shown in Fig. 10, for example, is a pixilated area wherein some or all of the pixels are capable of holding one or more pixel reagents. The pixel reagents are selected such that, when a pixel reagent comes into contact with a particular substance or element, a desired reaction occurs. See also, for example, page 10, line 3 – page 11, line 16 discussing Figs. 6 and 7. Claim 1 no longer recites a "droplet of liquid". Claim 2 has been amended to make clear that

movement is caused by the density of the nanostructured projections. Claim 4 no longer recites a droplet of reagent. Claim 1 makes clear that the reagent pixel and the droplet are separate and distinct entities. They may include the same or different reagents without limitation. Claim 5, dependent from claim 1, functionally defines the adaptation to absorb particles. Claim 6 no longer recites "such as". Claim 6, dependent from claim 1, functionally defines the adaptation to transport particles to the reagent pixel. Claim 2 has been amended to provide antecedent basis for "density", "area", and "highest density". Antecedent basis for "tips" is defined in claim 1 as amended.

The Rejection Under 35 U.S.C. § 102

Claims 1 and 3-6 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by Heller. Applicants respectfully traverse this rejection and request that it now be withdrawn, in view of the above amendments in the claims and the discussion below.

Heller discloses a self-addressable, self-assembling microelectronic system which can actively carry out and control multi-step and multiplex reactions in microscopic format. Col. 1, lines 8-11; col. 5, lines 25-27. The system has a matrix of addressable microscopic locations on its surface. Each individual micro-location is able to electronically control and direct the transport and attachment of specific binding entities to itself. Col. 5, lines 36-43. Fig. 1 shows a basic design of self-addressable microlocations fabricated using microlithographic techniques. The three microlocations 10 (ML-1, ML-2, ML-3) are formed on the surface of metal sites (12) which have been deposited on an insulator layer/base material. Col. 10, lines 41-45. The microlocations constitute reservoirs for containing test samples. They are not projections. See, for example, the discussion of "micro-location chambers 57" at col. 14, lines 26-42 discussing

Fig. 5. See also, for example, Figs. 2, 6, 7, 8, 9, 10, 11, 12, 13 and 14; and the discussion of these figures in Heller. Heller fails to disclose and fails to suggest a plurality of nanostructured projections disposed on a surface.

Accordingly, Heller fails to disclose and fails to suggest a detector as defined in claim 1 as amended, comprising: a surface having a plurality of nanostructured projections disposed thereon, the projections having tips; a reagent pixel on the surface, between a plurality of the projections; means for moving a liquid across tips of the nanostructured projections without contacting the reagent pixel; and means for moving a liquid toward the surface in a way such that the liquid contacts the reagent pixel.

Claims 1 and 2 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by Lopez. Applicants respectfully traverse this rejection and request that it now be withdrawn, in view of the above amendments in the claims and the discussion below.

Lopez discloses separation of molecular species across a nanostructured matrix, a method of fabricating nanostructures comprising the matrix, and the use of such a matrix for separation and/or analysis of molecules by defining the physical size and/or chemical features of the nanostructures as a means of screening. Para. 0060. The term "nanostructure" is defined as referring to a protrusion or void having a diameter in at least one direction of 1 to 500 nm. Para. 0037. Arrays of nanostructures may be surface-modified with chemical species that enhance the separation characteristics of the matrix. These chemical species may be distributed uniformly over the nanostructured separation matrix or may be distributed in a gradient in the direction of separation over the matrix. These chemical species may include small organic molecules, polymers, receptors or other biomolecules. Para. 0085. Molecular species may be driven in the direction of a gradient by electrophoresis. Para. 0076; see also, for example, para. 0087.

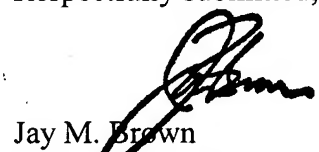
Monomolecular layers may be created from a wide range of commercially- or synthetically-available chemical species that will enhance separation characteristics based on the type and degree of interaction of chemical species being separated with the walls of the surface-modified nanostructured separation matrix. Examples of types of surface modifications include the use of biomolecular or organic receptors to elicit molecular recognition of small molecules, polymers, proteins, DNA, RNA, or oligonucleotides with the surface. Para. 0086.

Lopez does disclose a detector comprising a surface having a plurality of nanostructured projections having tips, disposed on the surface. However, Lopez fails to disclose, and fails to suggest as defined in claim 1, a reaction pixel on the surface, between a plurality of the projections. Lopez also fails to disclose and fails to suggest as defined in claim 1, a means for moving a liquid across tips of the nanostructured projections without contacting such a reagent pixel. Lopez further fails to disclose and fails to suggest as defined in claim 1, means for moving a liquid toward the surface in a way such that the liquid contacts such a reagent pixel.

Conclusion

Since all of the pending claims, as amended, are not anticipated by and are unobvious over the cited references, a notice of allowance is respectfully solicited. The Examiner is respectfully requested and invited to contact the undersigned by telephone in order to resolve any remaining issues.

Respectfully submitted,



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